REMARKS

The Office Action of March 2, 2006 and the references cited therein have now been carefully studied. Reconsideration and allowance of this application are earnestly solicited.

As described in our amendment filed on December 13, 2005, the present invention is directed to a method and system for the reduction or removal of noise in the presence of speech or any other information signal. The method and system would operate completely in the frequency domain and would employ estimating a non-Gaussian distribution function for the information signal spectral amplitude. A Gaussian mixture model could be employed to model the non-Gaussian characteristics of the information signal. The input signal would be decomposed into multiple spectral bands and a gain function would be produced for each of the spectral band utilizing a dynamically updated non-Gaussian distribution function for the information signal spectral amplitude.

The Examiner has rejected all of the claims under 35 USC §103(a) as being unpatentable over an article authored by Lee et al in view of U.S. Patent 6,415,253 issued to Johnson. This rejection is respectfully traversed.

As previously indicated, the present invention operates totally in the frequency domain. It is noted that all of the processing described in the Lee et al article is accomplished in the time domain with absolutely no processing being done in the frequency domain. Although it is admitted that all of the processing in the system and apparatus described in the Johnson patent is done in the frequency domain, it is respectfully maintained that it would not be obvious to combine the teachings of one algorithm in which all of the processing is done in the frequency domain with a second algorithm in which all of the processing is done in the time domain. Therefore, it is

respectfully believed that it would not be obvious to combine the teachings of the Lee et al and Johnson references.

Furthermore, it is noted that there are additional differences between the algorithm described in the Johnson patent with the method and system of the present invention. The gain function which is produced for each of the spectral bands in the Johnson reference would operate only if the power spectral density (PSD) was known of the speech-only signal. Utilizing the Johnson method, the PSD of the speech-only signal is calculated using spectral subtraction in which an estimate of the noise PSD is subtracted from the current PSD of a noise corrupted speech signal. Therefore, the Johnson reference does not directly estimate a non-Gaussian distribution function (and in turn the PSD) for the speech-only signal. This is in contradistinction with the present invention in which the system and method dynamically updates a non-Gaussian distribution function (and in turn the PSD) for the information signal amplitude in the frequency domain. This could be accomplished using a Gaussian mixture model to model the spectral amplitude of the speech information signal. The estimation of the non-Gaussian distribution function, and therefore the PSD, for the information signal spectral amplitude is used to compute the gain function for each of these spectral bands.

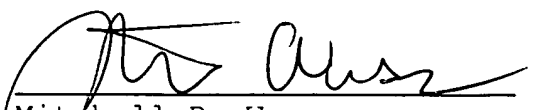
Applicant has amended claim 15 directed to a method of extracting an information signal from an input signal containing both the information signal and noise as well as system claim 33 for doing the same by specifically reciting a method and apparatus dynamically updating the non-Gaussian distribution function for the information signal spectral amplitude. It is maintained that regardless of whether the Lee et al and Johnson references can be combined, independent claims 15 and 33 as well as all of the claims depending directly or indirectly therefrom would not be anticipated or rendered obvious.

Furthermore, it is respectfully urged that the steps of estimating a non-Gaussian distribution and dynamically updating the non-Gaussian distribution function model are used with the other steps in independent claim 15 as well as the various additional means in claim 33 to produce an information signal or noise-reduced signal. This method as well as apparatus utilizing the aforementioned steps are a necessity to determine the gain functions for each spectral band. Independent claims 15 and 33 were amended in a manner to specifically claim a method as well as a system which would utilize the steps therein as well as the devices recited in claim 33 to extract an information signal from an input signal containing both the information signal and noise. It is believed that the inclusion of the language in which a dynamically updated non-Gaussian distribution function for the information signal spectral amplitude which has also been added to independent claims 15 and 33 does not create a new issue nor would warrant an additional search, and is properly added to the claims.

It is believed that the claims now present in this application do define the invention in a patentable manner and are not anticipated or rendered obvious by any combination of the Lee et al and Johnson references, nor by any other references known to the applicant. Consequently, reconsideration and allowance of this application are earnestly solicited.

If any fees are due and owing, please charge Deposit Account No. 08-2455.

Respectfully submitted,



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